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MARTIN MARIETTA ENERGY SYSTEMS, INC.

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Dr. Ronald O. Hultgren, Director
Enriching Operations Division
Department of Energy, Oak Ridge Operations
Post Office Box 2001
Oak Ridge, Tennessee 37831-8651

Dear Dr. Hultgren:

Off-Site Residential Drinking Water Monitoring Program

A review has been made of the information associated with off-site residential well water. The following information is a summary of the historical data available as well as the present knowledge that we have about the ORGDP's geology/hydrology. Also included is information concerning our future plans for addressing data collected from off-site residential wells.

Historical Data

The existing data on off-site groundwater monitoring is limited and not conclusive. The data consists of seven samples collected in 1981,[1] two samples collected in 1983,[1] site characterization data at the Clinch River Breeder Reactor Project (CRBRP),[2] and data that was collected by the Tennessee Department of Health and Environment (TDHE) during 1986 from residential wells in the "Bradbury and Poplar Springs Communities" (located south of the ORGDP across the Clinch River and west).[3]

The seven samples collected in 1981 were in the areas of Harriman, Oliver Springs, Blair, Sugar Grove, Dickey Springs, and Dyllis communities. These areas are located to the north of the ORGDP.

Most of the available data is on radioactive constituents, with a limited amount of metals and physical parameters and no organic analysis data.

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[1]Oak Ridge National Laboratory's Analytical Chemistry Division, Analytical Results, February 17, 1981, and February 8, 1983.

[2]Clinch River Breeder Reactor Project, Vol. 1, October 1981.

[3]Tennessee Department of Health and Environment, letter to Residents of Bradbury and Poplar Springs Communities, February 14, 1986.

The report from the TDHE states that not any of the concentration of radioactivity found in the samples was above the normal range of background for groundwater. The drinking water standard for alpha contamination is 15 pCi/l and 50 pCi/l for beta contamination. The limit for Cs-137 and Co-60 is 200 pCi/l and 100 pCi/l respectively.

The data that is available has been summarized and compared to the applicable limits in Table 1. The values shown in this summary represent maximum concentrations of all the data available.

In reviewing the data, there are only two parameters having results which exceed the drinking water standards; the parameters involved are gross alpha and total dissolved solids (TDS). The gross alpha was exceeded in only one sample and the TDS were exceeded in two samples. The TDS samples were from wells around the CRBRP and the gross alpha sample was from the Bradbury/Poplar Springs area. The sample that exceeded the gross alpha standard also had the highest gross beta result observed from the data. The exact sampling locations in the Bradbury and Poplar Springs communities are not known at this time.

Existing Off-Site Wells

There are approximately 20 to 25 groundwater wells located within a one-mile radius of the ORGDP. There is a well located at the TVA Blair Road Substation, one at the intersection of Blair Road and Highway 95, wells located at the Boeing Project area, and residential wells located in the Sugar Grove Valley Community (Fig. 1). Based upon our current understanding of the ORGDP hydrology/geology, it is unlikely that these wells could be affected by the groundwater at the ORGDP. The data that is available confirms this conclusion for radioactive constituents. However, there is no data available for metal and organic constituents.

ORGDP Groundwater Program

During the past three to four years, the ORGDP has developed and implemented an aggressive On-site Groundwater Monitoring Program. This program is to provide data for groundwater that is present in on-site treatment, storage, or disposal sites. The ORGDP groundwater program does not include any wells that are located off the Department of Energy reservation.

In developing the existing program, information has been gathered and interpreted by a groundwater contractor, Geraghty & Miller, Inc. To date, a total of 137 wells have been installed. The well locations were installed after characterization studies were performed to determine flow direction. After compiling the data from the 137 wells, we have been able to make some overall conclusion as to the general groundwater flow around the ORGDP. Generally, the groundwater flows towards the waterways to Poplar Creek and Clinch River (Fig. 2).

Existing groundwater data collected from these wells indicates that there are areas where there are concentrations of contaminants in excess of the drinking water standards. However, the bedrock lithology, geologic history, and regional structure do not appear to provide deep permeable zones for groundwater flow beyond the local system.

Our current information indicates that the groundwater at the ORGDP discharges into the surrounding creeks and rivers. It is unlikely that any groundwater contamination found on-site could have an effect on off-site residential groundwater systems. The uncertainty at this time is not having the data to ensure that there is not a deep aquifer which may be affecting residential groundwater systems. The off-site groundwater sampling program being developed should provide the needed information.

Future Plans for Off-Site Monitoring

The plans for future off-site groundwater monitoring include sampling existing residential wells around the Oak Ridge Reservation. The Off-site Groundwater Sampling Program is being coordinated by the Energy Systems Environmental and Safety Activities Organization. The program is still in the planning phase. Activities presently underway include a search for all data that is available for off-site wells, identification of sampling population, and determining the parameters to be analyzed. These actions are scheduled to be completed and the program implemented during the first quarter of FY 1989.

There is also a project for which funds are being solicited which would provide for a reservation-wide groundwater characterization. It is still uncertain at this time if the project will be funded in FY 1989.

Summary

The data that we have for off-site groundwater wells is limited. The information has been summarized to give you a brief description of the groundwater at the ORGDP. The information that we have about the geology/hydrology at the ORGDP indicates that the groundwater flow is towards the various surface water streams surrounding the facility.

If you have any questions or need additional information, please contact T. A. Bowers at extension 4-8224.

Sincerely,

W. R. Golliher, Manager
Oak Ridge Gaseous Diffusion Plant

WRG:TABowers:shh

Enclosures 3

cc/enc: T. A. Bowers - RC
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J. L. Haymore
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K. W. Sommerfeld
H. D. Whitehead, Jr.
File - WRG

Table 1. Groundwater Data Summary*

Parameter	Maximum concentration observed (mg/l)	Limit
Cadmium	0.003	0.01
Chromium	0.017	0.05
Fluoride	1.74	2.0
Lead	<0.01	0.05
Nitrate	9.1	10.0
Gross Alpha	16.8 ± 8.73 (pCi/l)	15 pCi/l
Gross Beta	16.5 ± 3.27 (pCi/l)	4 mrem/yr or 50 pCi/l
pH	7.35	6.5-8.5
Sulfate	14	250
Total Dissolved Solids	564	500
Zinc	0.45	5
Manganese	0.04	0.05
Copper	0.03	1.0
Co-60	12.5 ± 15.7	100 pCi/l
Cs-137	20.26 ± 8.54	200 pCi/l

*These parameters represent only those available in existing data.

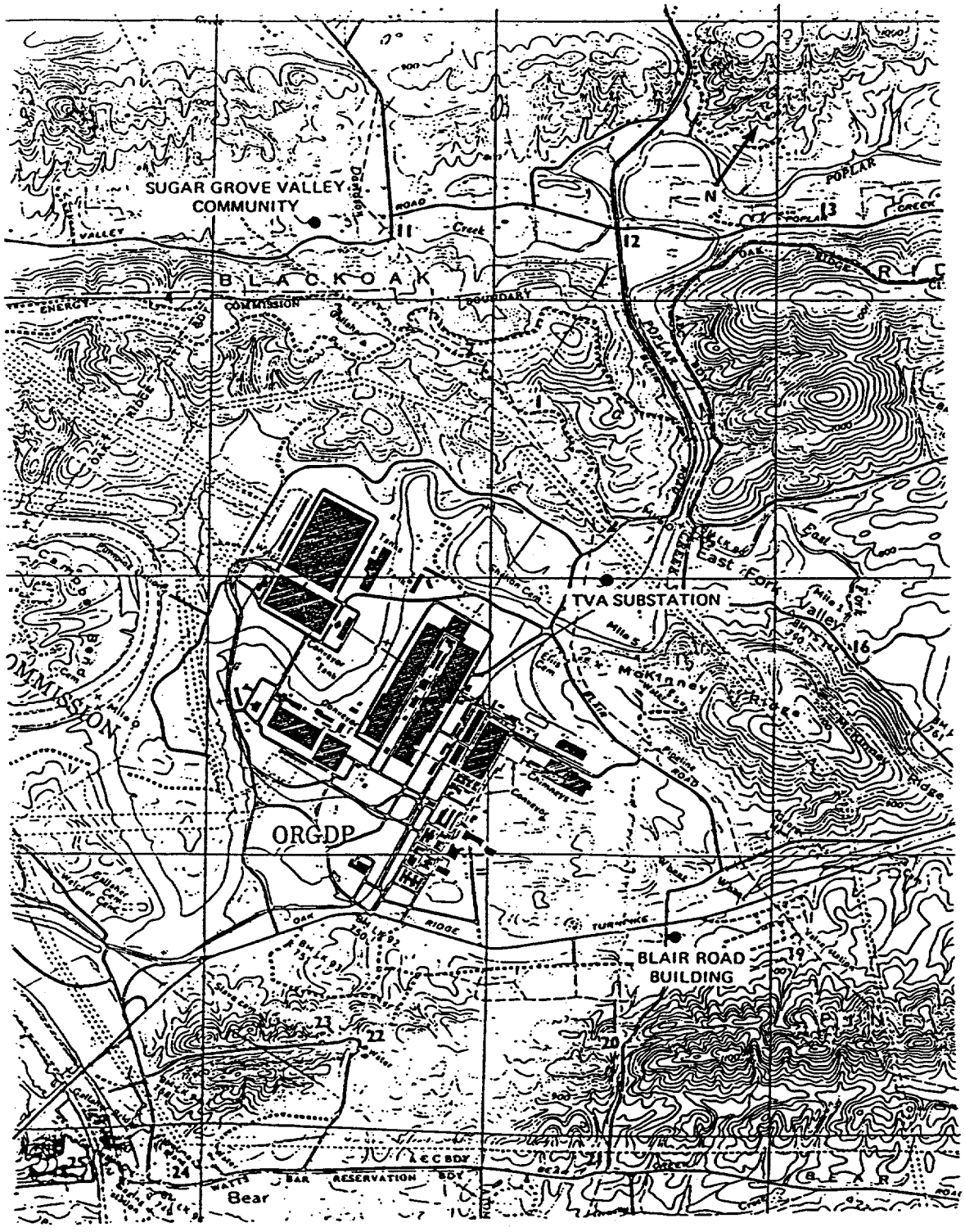

Fig. 1. Area Groundwater Wells Within One Mile of the ORGDP

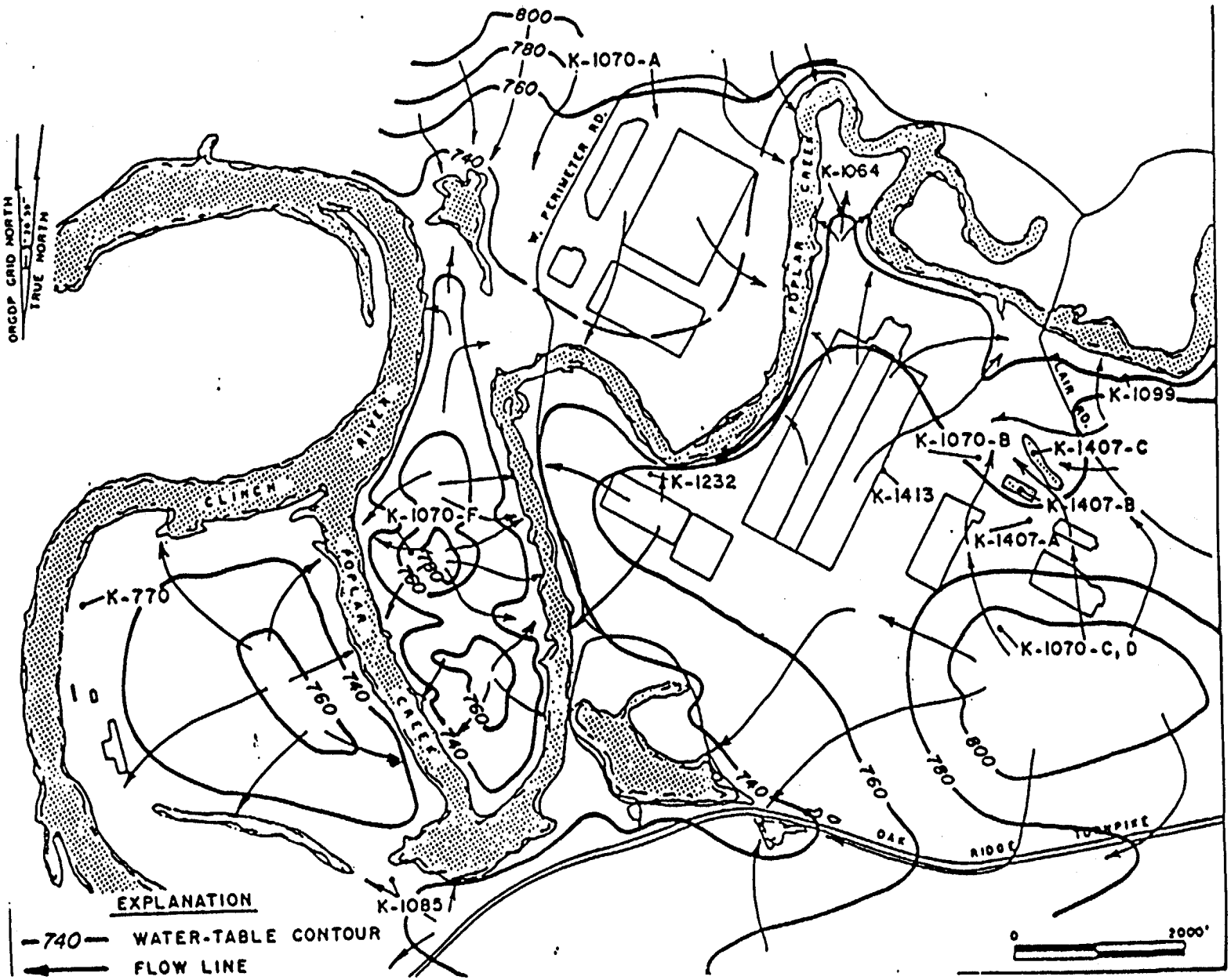

Fig. 2. Contours on the Water Table and Inferred Groundwater Flow Paths in the Uppermost Aquifer, ORGDP Area